

***DETAILED ACTION***

1. This office action is in reply to an amendment filed on November 07, 2007. **Claims 10, 17, 36, 51 and 66** are canceled, thus **claims 1-9, 11-16, 18-35, 37-50, 52-65 and 67-71** are pending/examined.
2. Examiner has reviewed claims 27-35 and 37-41 in view applicant's specification, paragraph 0098-0100 and found out that the limitation, "**computer readable medium**" includes elements which are not statutory categories of inventions. In order to overcome this, applicant's representative **Rhys Cheung Reg. No. 58,648** agreed to replace "computer readable medium" with "**computer-readable storage device or disk medium**". This limitation is supported by the specification. See Paragraph 0098-0100. Furthermore the limitation recited in apparatus independent claim 42 could all be software/set of instructions. In order to fix this, applicant's representative also agreed to add limitation "**one or more processors**" in the independent claim 42. Such amendment has support. See for instance the original apparatus independent claim 57. **(Interview summary has been attached).**

***EXAMINER'S AMENDMENT***

An examiner's amendment to the record appears below. Should the changes and/or additions be unacceptable to applicant, an amendment may be filed as provided by 37 CFR 1.312. To ensure consideration of such an amendment, it **MUST** be submitted no later than the payment of the issue fee.

Authorization for this examiner's amendment was given in a telephone interview with **Rhys W. Cheung** **Reg. No. 58,648** on 04/10/2008.

The application has been amended as follows: In the claims

- 27-41.** (Currently Amended) Please replace "computer-readable medium" with "computer-readable storage device or disk medium"
- 42.** (Currently amended) An apparatus for a first computer node for selecting a leader node to provide service to a plurality of other nodes in a multicast group, wherein each of the nodes communicates using multicast, broadcast or anycast messages, comprising:  
one or more processors;

means for issuing a first election call message;

means for receiving candidacy announcement messages from one or more leader candidate nodes in a specified time period;

means for selecting a victor from among all leader candidate nodes from which candidacy announcement messages are received;

means for receiving one or more victor announcement messages from one or more leader victor nodes for a second specified time period;

means for resolving zero or more collisions among the victor announcement messages to result in selecting the leader node;

means for receiving, in the first election call message, first identity information specifying a second node that sent the first election call message;

means for pushing the identity information onto a stack;

means for receiving a second election call message that includes second identity information specifying a third node that sent the second election call message; and

means for ignoring the second election call message when the second identity information is found in the stack.

### ***Allowable Subject Matter***

5. **Claims 1-9, 11-16, 18-35, 37-50, 52-65 and 67-71** are allowed.
6. The following is an examiner's statement of reasons for allowance:
7. Referring to **the former independent claims 1, 16, 27, 42 and 57** the art on the record, in particular, the combination of Gupta and Basani, discloses each and every limitation/s before the claims were amended.

For instance, **Gupta, the primary reference on the record, discloses a method performed by a first computer node for selecting a leader node to provide service to a plurality of other nodes in a multicast group, wherein each of the nodes communicates using multicast, broadcast or anycast messages, the method comprising the computer-implemented steps of** [*See, Figure 3, "The Complete Election Protocol"*]:

- **Issuing a first, election call message; [figure 3, "The Complete Election Protocol", see number 1]**(*On receiving "Init election" message I specifying Sequence, RoundNum, select K from RoundNum using strategy*)
- **Receiving candidacy announcement messages from one or more leader candidate nodes in a specified time period; [figure 3, "The Complete Election Protocol", see number 2]**

*(Find the set of members  $\{M_j\}_i$  in my view such that  $H(M_jAI) \times N_i < K$   
 find best preferred leader in my view and send this using ucast  
 messages to members in  $\{M_j\}_i$  do until Time Out 2/specified time  
 period receive similar preferred leader messages for this Sequence,  
 RoundNum from other members  $M_k$  include  $M_k$  in  $\{M_j\}_i$  and  $M_i$ 's  
 view) compare current best leader choice with  $M_k$ 's preference using  
 choice function if  $M_k$ 's preference better, update current best leader  
 choice and send ucast messages to all members in  $\{M_j\}_i$  specifying  
 this)*

- **selecting a victor from among all leader candidate nodes  
 from which candidacy announcement messages are received;  
 [figure 3, “the complete election protocol”, see number 2]**

*(Compare current best leader choice with  $M_k$ 's preference using  
 choice function if  $M_k$ 's preference better, **update current best  
 leader choice**, meets the limitation of selecting a victor from among  
 all leader candidate nodes from which candidacy announcement  
 message are received, and send ucast messages to all members in  
 $\{M_j\}_i$  specifying this)*

- **Receiving one or more victor announcement messages  
 from one or more leader victor nodes for a second specified  
 time period; [figure 3, “The Complete Election Protocol”, see  
 number 2 and 3] (else inform  $M_k$  using a ucast of  $M_i$ 's current best**

*choice wait Time Out 3/second specified time period, to receive everyone's final leader choice. 3. if received none or more than one leader as final choice, choose one of the final choice messages  $F$  if  $H(MiAF) \times Ni < K$ , multicast an initiating message  $I$  specifying Sequence, RoundNum+ 1 wait for Time Out 3, increment RoundNum and jump to step 1. if no re-initiating mcast received within another Time Out 3, declare received choice as elected leader and include it in  $Mi$ 's)*

- **Resolving zero or more collisions among the victor announcement messages to result in selecting the leader node.** [figure 3, "The Complete Election Protocol, see number 3, see last line"] *(else increment RoundNum and jump to step 1)*

**Gupta does not explicitly teach** "receiving candidacy announcement messages" and the limitation recited in claim 16 as, "the election call message, candidacy announcement messages, and victor announcement messages, are multicast, broadcast or anycast messages."

**However, in the same field of endeavor, Basani, the secondary reference on the record, discloses that** if any server fails to observe the LA messages for a configurable period, then such a server initiates a new election. In its simplest form, the first server to correctly notice the leader is dead and to claim leadership, via an issued "**Leader claim**" message, becomes the new leader. If no

other server sends a Leader **claim message (LC) to the group within a preset time**, then the vote is over, and the new leader **sends its own LA messages to the group/ victor announcement messages**. However, each GL candidate may have different priorities, i.e., one may be administratively deemed preferable over another.[See column 14, lines 26-39.

Furthermore on the **abstract Basani discloses the following**,  
“The members of a group of servers in a multicast network elect a group leader whenever a new group leader is required, as when the prior group leader become unavailable, as detected by absence of a periodic heartbeat message published by the leader. The election is carried out by a system of voting by each candidate whereby each candidate has a priority calculated from its configuration, and the server with the highest priority is configured to claim the leadership faster than the other candidates. As part of the claim, **each candidate multicasts its priority/ candidacy announcement messages**. Each candidate that receives a multicast claim for leadership from another candidate compares its own priority against the claimant and only votes for itself if its own priority is higher. After a preconfigured period of hearing no other claimants with higher priority, the candidate with the highest priority becomes the new leader.”

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- However the art on the record, does not disclose the limitation/s in the new independent claims 1, 16, 27, 42 and 57 after the claims are amended, because the objected dependent claims 10, 17, 36, 51 and 66 have been canceled and incorporated into the respective **independent claims**.

The combination of the reference on the record, does not disclose or suggest the function limitation, which is recited in the former dependent claims 10, 17, 36, 51 and 66, in combination with the other limitation recited in the respective independent claims.

None of the prior art of record taken singularly or in combination teaches or suggests such a method selecting a leader node with the functional limitation recited in the former objected dependent claims together with all the limitations recited in respective independent claims.

For the reasons provided above, the amended independent claims **1, 16, 27, 42 and 57** are found to be novel and allowed.

8. **The dependent claims which are dependent on the independent claims 1, 16, 27, 42 and 57** being further limiting to the independent claims, definite and enabled by the specification are also allowed.

Any comments considered necessary by applicant must be submitted no later than the payment of the issue fee and, to avoid



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processing delays, should preferably accompany the issue fee.

Such submission should be clearly labeled "Comments on

Statement of Reasons for Allowance."

### ***Conclusion***

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Samson B Lemma whose telephone number is 571-272-3806. The examiner can normally be reached on Monday-Friday (8:00 am --4:30 pm).

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, BARRON JR GILBERTO can be reached on 571-272-3799. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

/Samson B Lemma/

Examiner, Art Unit 2132

04/10/2008.

/S. B. L./

/Gilberto Barron Jr/

Supervisory Patent Examiner, Art Unit 2132